

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Reference sign "10" recited in line 19 of page 6 is not shown in the drawings. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scholl (US 6,972,521) in view of Bogner (US 6,649,946).
5. Regarding independent claim 1, Figure 1 of Scholl shows a low-pressure vapor discharge lamp comprising a radiation-transmitting discharge vessel enclosed, in a gastight manner, a discharge space provided with gas filling, the gas filling being substantially free of mercury (Abstract) and comprising an indium compound and a buffer gas (col. 3, ln. 27-31), the discharge vessel comprising discharge means (2) for maintaining a gas discharge in the discharge space, the discharge vessel being provided with a luminescent layer (4).
6. Scholl teaches the limitations of independent claim 1 discussed earlier but fails to exemplify the luminescent layer comprising a luminescent material based on a nitridosilicate or on an oxonitridosilicate.
7. Bogner teaches that it is known in the art to provide lamps with a luminescent layer comprising a luminescent material based on a nitridosilicate or on an oxonitridosilicate (col. 2, ln. 35-40). Bogner discloses that this arrangement is provided for improving overall color rendition (col. 2, ln. 10-11).

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8. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the lamp of Scholl with a luminescent layer comprising a luminescent material based on a nitridosilicate or on an oxonitridosilicate, as taught by Bogner, for improving the efficiency of the lamp.

9. Regarding claim 2, Bogner discloses the luminescent material comprising rare-earth emitters (col. 2, ln. 35-40).

10. Regarding claim 3, Bogner discloses the luminescent material comprising europium, cerium, or ytterbium emitters (col. 2, ln. 35-40).

11. Regarding claim 4, Bogner discloses the luminescent material comprising an oxonitridosilicate comprising aluminum (col. 2, ln. 31-40).

12. Regarding claim 5, Bogner discloses the luminescent layer comprising a luminescent material selected from the group formed by  $(\text{Sr}_{1-x-y-z}\text{Ba}_x\text{Ca}_y)\text{Si}_2\text{N}_2\text{O}_2:\text{Eu}_z$ , where  $0 < x < 0.2$ ,  $0 < y < 0.2$ , and  $0 < z < 0.1$ ;  $\text{Ca}_{1-x-y}\text{Sr}_x\text{Si}_2\text{N}_2\text{O}_2:\text{Eu}_y$ , where  $0 < x < 0.5$  and  $0 < y < 0.1$ ;  $(\text{Sr}_{1-x-y-z}\text{Ca}_x\text{Ba}_y)_2\text{Si}_5\text{N}_8:\text{Eu}_z$ , where  $0 < x < 1$ ,  $0 < y < 1$ , and  $0 < z < 0.1$ ;  $(\text{Sr}_{1-x-y-z}\text{Ba}_x\text{Ca}_y)_2\text{Si}_{5-a}\text{Al}_a\text{N}_{8-a}\text{O}_a:\text{Eu}_z$ , where  $0 < x < 1$ ,  $0 < y < 1$ ,  $0 < z < 0.1$ , and  $0 < a < 4$ ; and  $(\text{Sr}_{1-x-y-z}\text{Ba}_x\text{Ca}_y)\text{Si}_2\text{N}_2\text{O}_2:\text{Yb}_z$ , where  $0 < x < 0.2$ ,  $0 < y < 0.2$ , and  $0 < z < 0.1$ .

13. Regarding claim 6, Bogner discloses the luminescent layer comprising a luminescent material selected from the group formed by  $\text{Y}_3\text{Al}_5\text{O}_{12}:\text{Ce}$ ;  $(\text{Y}_{1-x}\text{Gd}_x)_3(\text{Al}_{1-y}\text{Ga}_y)_5\text{O}_{12}:\text{Ce}$ , where  $0 < x < 1$  and  $0 < y < 1$ ;  $\text{Sr}_2\text{CeO}_4:\text{Eu}$ ,  $\text{Y}_2\text{O}_3:\text{Eu}$ ,  $\text{Bi}$ ;  $(\text{Y}, \text{Gd})_2\text{O}_2:\text{Eu}$ ,  $\text{Bi}$ ;  $\text{Y}(\text{V}, \text{P})\text{O}_4:\text{Eu}$ ;  $\text{Y}(\text{V}, \text{P})\text{O}_4:\text{Eu}$ ,  $\text{Bi}$ ;  $(\text{Sr}, \text{Mg}, \text{Ca})\text{S}:\text{Eu}$ ;  $\text{Y}_2\text{O}_2\text{S}:\text{Eu}$ ;  $(\text{Ba}, \text{Sr})\text{MgAl}_{10}\text{O}_{17}:\text{Eu}$ ,  $\text{Mn}$ ;  $\text{ZnS}:\text{Cu}$ ,  $\text{Al}$ ,  $\text{Au}$ ;  $\text{SrGa}_2\text{S}_4:\text{Eu}$ ;  $(\text{Sr}, \text{Ba}, \text{Ca})(\text{Ga}, \text{Al})_2\text{S}_4:\text{Eu}$ ;

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(Y, Gd)BO<sub>3</sub>:Ce, Tb; (Y, Gd)<sub>2</sub>O<sub>2</sub>S:Tb; LaOBr:Ce, Tb; (Ba, Sr)MgAl<sub>10</sub>O<sub>17</sub>:Eu;

(Ba, Sr)<sub>5</sub>(PO<sub>4</sub>)<sub>3</sub>(F, Cl):Eu; Y<sub>2</sub>SiO<sub>5</sub>:Ce; ZnS:Ag; and La<sub>0.7</sub>Gd<sub>0.3</sub>OBr:Ce.

14. Regarding claim 7, Bogner discloses the emission from the luminescent layer and the emission from the gas discharge together forming white light (col. 2, ln. 12).

15. Regarding claim 8, Scholl discloses the discharge vessel being surrounded by an outer bulb, the outer surface of the discharge vessel being coated with the luminescent layer (col. 3, ln. 21-25).

16. Regarding claim 9, Scholl discloses the discharge vessel being surrounded by an outer bulb, the outer bulb being coated with the luminescent layer (col. 3, ln. 21-25).

### ***Conclusion***

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Schmidt (US 2006/0011922) discloses a light-emitting device. Scholl (US 6,731,070) discloses a low-pressure gas discharge lamp with mercury-free gas filling. Hilbig (US 6,603,267) discloses a low-pressure gas discharge lamp with copper-containing gas filling.

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Quarterman whose telephone number is (571)272-2461. The examiner can normally be reached on M-TH (7-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minh-Toan Ton can be reached on (571) 272-2303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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